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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Timothy K. Miller

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09/20/2004

POSZ & BETHARDS, PLC  
11250 ROGER BACON DRIVE  
SUITE 10  
RESTON, VA 20190

EXAMINER

LIU, SHUWANG

ART UNIT

PAPER NUMBER

2634

DATE MAILED: 09/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/685,195

**Applicant(s)**

MILLER ET AL.

**Examiner**

Shuwang Liu

**Art Unit**

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-9 and 11-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-6,8,9,11-13 and 15-17 is/are rejected.
- 7) ☒ Claim(s) 7 and 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12</u> . | 6) <input type="checkbox"/> Other: _____  |

***Response to Arguments***

1. Applicant's arguments regarding the amended claims 1, 8 and 15 filed 06/17/04 have been fully considered but they are not persuasive. The Examiner has thoroughly reviewed Applicant's arguments but firmly believes that the cited reference reasonably and properly meet the claimed limitation as rejected. The rejections for claims 7 and 14 are withdrawn because of the amendment.

Applicant's argument – regarding the amended claims 1, 8, 15, the Applicant argues that “ Because the Examiner did not provide anything beyond a general assertion that it is well known that BPSK and QPSK are commonly used, based on the Examiner's skill in the art, for the motivation to include BPSK or QPSK modulation in a UWB system, Applicant asserts that Examiner engaged in hindsight analysis, improperly using Applicant's own claimed invention to provide the motivation to combine the cited references.”

Examiner's response – As disclosed in lines 41-51 of column 6 by Richards et al., “ Any aspect of waveform can be modulated to convey information and, further modulation aids in smoothing the spectrum, minimizing structure in the resulting spectrum. Amplitude modulation, phase modulation, frequency modulation, time shift modulation, and M-ary versions of these have been proposed.” One skilled in the art should have a basic knowledge what the phase modulation and M-ary modulation are (for example, see Newton's Telecom Dictionary or text book “Digital Communications”, Bernard Sklar). In general M-ary signaling case, the processor accepts  $k$  source bits at a time and instructs the modulator to produce one of an available set of  $M = 2^k$

waveform types. Binary modulation, where  $k=1$  is just a special case of M-ary modulation. M-ary phase signals (i.e. discrete phase modulation schemes) have "M" discrete phases. Therefore, M-ary modulation as disclosed by Richards includes at least bi-phase modulation ( $M=2$ ). Phase modulation also includes at least bi-phase modulation from the definition of the phase modulation. Indeed, Richards et al. discloses the incoming pulses are at least one of bi-phase modulated and quadrature phase modulated as recited in claims.

In previous office action, the Examiner uses the reference of Johnson et al. (US 5,289,476) to make further explanation for the phase modulation and the selection of bi-phase or quadrature phase modulations. Such limitations are merely a matter of design choice and would have been obvious in the system of Richards et al. The different modulation schemes can be used in various communication system, not only in power line communication, wireless communications, but also in Ultra-Wideband system, such as taught by Richards et al. and Dress, Jr. et al. cited in paper #8 (lines 16-46, column 9).

As the Federal Circuit stated in *In re Rouffet*, 47 U.S.P.Q2d 1453, 1457-1458:

To prevent the use of hindsight based on the invention to defeat patentability of the invention requires examiner to show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reason that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the element from the cited prior art

reference for combination in the manner claimed. The court has identified three possible sources for a motivation to combine references: the nature of the problem to be solved, the teaching of the prior art, and the knowledge of persons of ordinary skill in the art.

In this case, the teaching of the prior art and the knowledge of persons of ordinary skill in the art give the motivation to combine references. The teaching in the prior art as a whole suggests the desirability, and thus the obviousness, of making the combination.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 4-6, 8, 9, 11-13 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richards et al. (US 6,556,621) in view of Raphaeli et al. (US 6,614,864) and Johnson et al. (US 5,289,476).

As shown in figures 1A, 2A, 4, 5, 8, 10-12 and 15, Richards et al. disclosed:

(1) regarding claims 1, 8 and 15:

a method and a system for identifying a phase of an incoming UWB signal at a UWB receiver, comprising the steps of:

receiving incoming pulses of the incoming UWB signal (706 in figure 7), adjacent pulses of said incoming pulses arriving at a fixed interval (column 4, lines 28-67, column 5, line 1-column 6, line 10 and 404 in figure 5, figure 2A);

generating local pulses (730) at the UWB receiver;

correlating ( 710) the local pulses with the incoming pulses to produce a correlation function; and

determining if the correlation function (result) exceeds the threshold for a lock condition (synchronization) (steps 4-14 in figure 10).

Richards et al. discloses all of the subject matter as described above except for specifically teaching (A) determining a maximum of the correlation function and (B) the phase modulation that comprises at least one of bi-phase modulation (BPSK), and quadrature phase modulation (QPSK).

With respect to item (A), Raphaeli et al., in the same field of endeavor, teaches a method for acquiring synchronization, wherein once the correlation result (function) exceeds the threshold, the maximum of the correlation function is determined (figure 4, and 98 in figure 5, column 17, lines 25-60). That is, the maximum of the correlation function is determined by the exceeding the threshold during the acquiring synchronization.

It is well known that the maximum of the correlation function is determined by checking if the correlation function exceeds the threshold value. The well-known method to determine the maximum of the correlation provides for a more reliable communication in the presence of high narrowband noise, spectral distortion and pulse

noise and can be utilized to identify an incoming received signal more quick and efficient. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to determine the maximum correlation by a threshold as taught by Raphaeli et al. in the acquiring synchronization of Richard et al. in order to allow the receiver to demodulate UWB signal more quick and efficient and provide a more reliable communication in the presence of high narrowband noise, spectral distortion and pulse noise.

With respect to item (B), Johnson et al. teaches the phase modulation commonly comprising BPSK and QPSK (column 1, lines 11-62).

It is well known that BPSK and QPSK are commonly used. In the BPSK system, there are two phases: an in-phase signal and  $180^0$  out of phase signal. In a QPSK system, there four phases. One skilled in the art would have clearly recognized that the nature of various modulations that can be selected is dependent on the respective application. As taught by Johnson et al., the QPSK modulation can be used when low levels of interference allow fast transmission; The BPSK modulation may be used when greater reliability is necessary in a noise environment (column 2, lines 23-32).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use BPSK or QPSK as taught by Johnson et al. in the system of Richard et al. in order to achieve fast transmission by using BPSK or achieve greater reliability in a noise environment by using QPSK.

(2) regarding claims 2 and 9:

wherein the fixed interval is the time between the incoming pulses (column 4, lines 28-67, column 5, line 1-column 6, line 10 and 404 in figure 5).

(3) regarding claims 4 and 11:

wherein the incoming pulses are multilevel pulses (column 7, lines 1-15).

(4) regarding claims 5 and 12:

wherein the step of correlating the incoming pulses with the local pulses to produce a correlation function comprises:

shifting a phase of the local pulses (48 in figure 15); and

calculating a correlation value of the local pulses and the incoming pulses (49).

(5) regarding claims 6 and 13:

wherein the correlation value comprises the correlation function (49 and 50).

(6) regarding claims 16 and 17:

wherein the local pulse are generated at the fixed interval, but a variable phase with respect to the incoming pulses (column 6, line 42-column 9, line 25).

4. Claims 7 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shuwang Liu whose telephone number is (571) 272-3036.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin, can be reached at (571) 272-3056.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

**or faxed to:**

**(703) 872-9306 (for Technology Center 2600 only)**

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.



Shuwang Liu  
Primary Examiner  
Art Unit 2634

September 13, 2004